

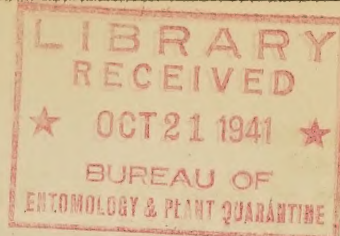
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The

EXTENSION

ENTOMOLOGIST



Extension entomologists are playing a very necessary part in the National Defense program. We may not be forging cannon, or building airplanes, and thus far no one has been called to armed service, but a few are reserve officers; they and others may be called at any time. The part to be played by those who go is perfectly obvious because there are many pests, such as flies, mosquitoes, and lice, which affect the well-being of soldiers and sailors. Men with training in extension entomology can be of invaluable service in protecting the health of the armed forces and by saving their food and clothing from insect depredations.

Those who are not called will also have many functions to perform. They too will serve in an advisory capacity in much the same way as those who are called. Their greatest duty, however, will be with "the army behind the army." It has been stated repeatedly that plenty of the right kind of food is essential to the success or failure of a nation. Such food, whether it be crops or livestock, will need to be protected from damage by insects. If a well-balanced diet is to be had, home gardeners and commercial vegetable growers cannot afford to grow only those crops that are less frequently destroyed by insects and diseases, but must produce those most essential to good health.

Insect damage does not stop with harvest, but the products stored or manufactured from our crops and livestock are subject to insect attack, and the public at large needs suggestions on control measures.

The extension entomologists have a bigger job than ever before, and we must be on our toes and ready to meet the new difficulties as they arise.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE AND
EXTENSION SERVICE, COOPERATING

CONTENTS

	<u>Page</u>
Announcements	55
Personnel.....	56
Results of survey of The Extension Entomologist.....	57
Excerpts from annual reports:	58
Preparedness in insect control - Colorado.....	58
Exhibits - Arizona.....	58
Relationships - Ohio.....	59
Boll-weevil control - Texas.....	59
Cabbage aphid control with nicotine vaporizer - Pennsylvania..	61
Sulfur-derris prevented bean leafhopper damage - Texas.....	61
Foliar nematode on chrysanthemums - Pennsylvania.....	61
Tomato fruitworm - North Carolina.....	62
Cattle louse control - South Carolina.....	62
Household insects - North Carolina.....	63
4-H Club work - New York.....	64
What is the job of an extension apiarist? - Ohio.....	64
Apiculturists - Ohio.....	65
Junior bee-management club - Pennsylvania.....	65
4-H bee summary - South Carolina.....	65
Marketing - Pennsylvania.....	66
Timely topics:	67
Parafoulbrood limited to southeast.....	67
Sugar concentration controls bee activity.....	68
Home-made beeswax candles.....	68
Entomologists' service valued.....	69
Effect of low moisture content in grain on certain insect species.....	69
Hessian fly-resistant wheat makes good showing in field test..	69
Removal of lead and arsenic spray residues on apples.....	70
Control of (cantaloup)pickleworm.....	70
Diluents for natural cryolite in controlling tomato fruitworm.	70
Beet molasses as a dispersing agent for phenothiazine.....	70
Necessity of a low oxygen concentration for hatching <u>aedes</u> mosquito eggs.....	71
Dihydrorotenone.....	71
645,000 families grow gardens under AAA plan.....	71
Florida tries specialty crops.....	72
Cork, rubber plantings in California.....	72
U. S. D. A. plant specialists leave on Mexican survey.....	72
Publications.....	73

UNITED STATES DEPARTMENT OF AGRICULTURE

Washington, D. C.

THE EXTENSION ENTOMOLOGIST

Issued by the Extension Service and the Bureau of Entomology
and Plant Quarantine cooperating with other Federal and State
agencies in the furtherance of extension work in entomology

M. P. Jones
Senior Extension Entomologist

ANNOUNCEMENTS

- November 13-14, 1941. Eastern Branch, American Association of Economic
Entomologists. Baltimore, Md.
- November 21-22, 1941. Cumberland-Shenandoah Valley Fruit Conference.
Winchester, Va.
- December 29, 1941-January 1, 1942. American Association of Economic
Entomologists. San Francisco, Calif.

PERSOMNEL

Illinois - Mr. H. B. Petty became extension entomologist on September
15, 1941. His address is Natural Resources Building, Urbana, Ill.
Mr. Petty is an Illinois farm-reared boy, and for the past 3 years
has worked as student assistant on several research projects dealing
with different lines of entomology work. He is a graduate of the
University of Illinois and has practically completed work for his
master's degree.

Dr. P. N. Annand was appointed chief, and Avery S. Hoyt associate chief of the Bureau of Entomology and Plant Quarantine. Both appointments were effective August 16. Doctor Annand succeeds Lee A. Strong, who died June 2, 1941.

Doctor Annand, who has been one of the assistant chiefs of the Bureau, was born in Telluride, Colo., in 1898. He was graduated with a B. S. degree in 1920 from Colorado Agricultural College, where he specialized in entomology. He received an M. A. degree in entomology from Leland Stanford University in 1922, and a Ph. D. in zoology and botany from Stanford in 1928.

Before joining the Department of Agriculture staff in 1929, Doctor Annand did research work on sugar beet insects for a sugar company from 1920 to 1921, and was on the staff of San Mateo Junior College from 1922 to 1929. During the latter part of that time he was head of the college's department of biological sciences.

From 1934 until 1937 Doctor Annand was head of the Division of Cereal and Forage Insect Investigations of the Bureau of Entomology and Plant Quarantine. In 1937 he was appointed research assistant to the chief of the bureau. In April 1939, he was named an assistant chief of the Bureau.

Doctor Annand is a member of the American Association for the Advancement of Science, the American Association of Economic Entomologists, the Entomological Society of America, and the Washington Entomological Society.

Mr. Hoyt also was an assistant chief of the Bureau. He was born in San Diego, Calif., on September 16, 1888. He was graduated with the B. S. degree from Pomona College in 1910. He held various positions under the State Department of Agriculture of California and was made assistant director in 1929 and director in 1931, in which year he severed his connection with the State Department of Agriculture and became assistant chief of the Plant Quarantine and Control Administration, of the United States Department of Agriculture, which position he held until the consolidation of that Bureau in 1934 with the former Bureau of Entomology into the present Bureau of Entomology and Plant Quarantine.

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Thirty-eight employees of the Bureau of Entomology and Plant Quarantine have enlisted in, or been called to perform, military service, or have been assigned by transfer or loan to other units of the Government to carry out special activities associated with National Defense.

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RESULTS OF SURVEY OF "THE EXTENSION ENTOMOLOGIST"

The Extension Entomologist has been published about 4 years, with relatively little change in the format. For this reason, an attempt was made to check on relative values of different sections. At the time of checking the mailing list, a questionnaire was sent to the extension, research, teaching, quarantine, and control entomologists. They were asked to rate, from one to six, their preference of the six main sections of The Extension Entomologist. These are: Announcement of meetings, personnel announcements, articles, annual report excerpts, timely topics, and list of publications.

The thought was expressed that greatest emphasis should be placed on replies of extension entomologists, because the publication was originally prepared for their use. However, in tabulating data, it is interesting to note that ratings of all are nearly the same, as indicated by the following table:

Relative Values of Six Main Sections of The Extension Entomologist
Summarized From Replies to Questionnaire

Rating	:Announce- :ment of :meetings	:Personnel: :announce- :ments	Ar- : ti : cles :	Annual : report : exerpts :	Timely : topics :	Pub- lica- tions
Percentage preference:	:	:	:	:	:	:
By 32 extension entomologists	: 12	: 13	: 21	: 17	: 20	: 16
By 160 others	: 10	: 12	: 22	: 17	: 22	: 17
By all 292 replying	: 10	: 12	: 21	: 17	: 22	: 17
Percentage of space in previous issues devoted to different sections:	: 5	: 4	: 20	: 32	: 26	: 13

The bottom line of figures, by comparison with others, indicate less space was devoted to announcements of meetings and personnel, and publications, than was previously allotted to them. However, this space cannot be expanded, because all announcements pertaining to these three sections that come to my attention are listed.

It is interesting to note that so many entomologists in fields other than extension were as interested in annual report excerpts as were the extension entomologists, because these excerpts pertain largely to extension. They are selected to show different approaches to doing the job rather than to give subject matter. The survey indicates that 17 percent of the space might be

devoted to annual report excerpts, instead of 32 percent; and unless suggestions to the contrary are received, this section will be gradually reduced, and more space will be devoted to articles and timely topics.

The prompt response to the questionnaire by more than 90 percent of those to whom it was sent is greatly appreciated. It is particularly gratifying to note that The Extension Entomologist so nearly meets the desires of its readers.

EXCERPTS FROM ANNUAL REPORTS

PREPAREDNESS IN INSECT CONTROL

Because of the sporadic and usually unpredictable nature of most insect outbreaks, control depends on the preparedness program for just such emergencies. During years of serious outbreak, little time can be spent other than with immediate execution of the campaign. Accomplishments in such cases are easy to measure. Although achievements may not be recorded in such definite figures, from a commodity yield standpoint, on years of normal or subnormal insect populations, they are probably more important, because it is during such years that our defense or preparedness program receives due attention.

The education program in entomology is a year-round program, the total effect of which can be measured only in a general way. Cooperative campaigns usually give rise to definite figures. However, with general pest control of truck crops, it is necessary to take into consideration the prevalence of the various pests in regarding the value of the figures that show the number of growers following recommended practices.

--Annual Report, Colorado Extension
Entomologist, 1940.

EXHIBITS

The purpose of this cotton insect control project was to assist growers in Maricopa County especially in becoming familiar with cotton insects, the damage produced, and methods of making population counts. For this purpose a project was begun last season to prepare exhibits showing specimens of the five most important insects attacking cotton, and the cotton bolls showing the type of injury produced. These specimens were mounted on a cardboard approximately 18 by 25 inches, on which appeared also a brief statement of control measures and a picture showing the proper method of applying insecticides for control of these insects.

Forty of these exhibits were distributed last fall to each of the 28 cotton-gin offices in Maricopa County, the five county agricultural agents, and offices of the Agricultural Adjustment Administration in other cotton-growing counties. During this year, 30 additional exhibits

have been prepared for distribution to all leading finance organizations interested in cotton production, to leading insecticide companies, and to larger cotton-growing companies. These exhibits located in places visited by growers, and others interested in cotton production, should enable them, in connection with the transaction of their business, to become familiar with cotton insects and the damage caused by them.

--Annual Report, Arizona Extension
Entomologist, 1940.

RELATIONSHIPS

Crop losses from insects are so large, and possibilities for service so great, that effective extension work can be done only through close cooperation with other State departments, and with various Federal agencies now operating in the field.

Extension specialists have cooperated closely with specialists of other departments where projects overlapped. The chief interrelated projects were: Plant pathology, pomology, and vegetable gardening. Other cooperative arrangements were carried out with specialists in agricultural engineering, agronomy, and agricultural economics, and 4-H Clubs.

Cooperation with entomologists of the Ohio Department of Agriculture was enjoyed, and through such arrangement the annual wheat insect survey was planned and carried out. The Department of Entomology at the Ohio Experiment Station was called upon repeatedly for aid in the field, covering the subject of surveys, exhibits, and result demonstrations. A close working arrangement exists between the bee culture specialist and the State apiculturist in work connected with the eradication of bee diseases. Valuable aid was obtained from the field laboratories of the United States Department of Agriculture located in Ohio.

--Annual Reports, Ohio Extension
Entomologist, 1940.

BOLL-WEEVIL CONTROL

The county agent of Victoria County, John Saunders, reports his work as follows:

"During the past year there has been more constructive work carried out on insect control than at any time in the past years, on account of educational work that has been carried on in the county, and also a well-organized farm group in each of 12 one-variety cotton communities.

"Cooperative marketing of the one-variety cotton in Victoria County, where each producer is paid in accordance to the grade and staple of his cotton, has contributed much to insect control work. Farmers have learned that by protecting the early forms put on by the young plant, they have, of course, earlier cotton, which, as a rule, sells for a

better price. They find that by holding the first fruit, the cotton does not make so rank a growth, which usually results in having to pay more for picking and, usually, results in more trash, cutting the grade of cotton and lowering the price. This method is brought out forcibly where a control practice is carried out by part of the producers in a community and not by others where they can compare prices received based on actual grade and staple.

"Another method followed in this county that has appealed to the farmers is that of making infestation counts to determine the infestation of fleas or weevils before applying sulfur or poison, so that it can be applied when needed and where needed. In using this method, it has been found that an application of sulfur or poison might be used to a good advantage on a part of the farm and would be wasted on another part. Farmers are ready to take control measures when they can see the necessity for doing so. A number of large-scale farmers have followed the practice of making infestation counts and dusting that have never dusted before for fleas and weevils. They have learned to check the damage being done, then following an application, check to find they have accomplished good results.

"Through organization, noticeable results have been accomplished in lessening the boll-weevil infestation by plowing under cotton stalks immediately following the completion of picking. This year, 95 percent of the cotton stalks were destroyed within 15 days after the last bale of cotton was ginned. This not only reflects results from insect control, but also from increased yields."

In Hamilton County, a small-cotton-producing county, insect control is paying dividends according to County Agent T. D. Craddock:

"Boll-weevil and flea-hopper control by dusting was used quite extensively in Hamilton County during 1940. The Hamilton Cotton Oil Mill handled sulfur and calcium arsenate, and sold this material to the farmers at $2\frac{1}{2}$ to 3 cents for sulfur and $6\frac{1}{2}$ to 7 cents a pound for calcium arsenate. Approximately 175,000 pounds of calcium arsenate were sold.

"Eighty-five new dusting machines were put into use for the first time in 1939, and demonstrations such as the following were reported from a good many producers.

"W. L. Schrank of the Aleman community harvested 261 pounds of lint cotton per acre where he dusted, and only 140 pounds in the same field from the same type of land, same variety of cotton, and worked exactly as the other, with the exception of dusting. The cost of dusting was \$3.45 an acre, and made 121 more pounds of lint an acre at approximately \$6.50 clear profit per acre."

--Annual Report, Texas Extension
Entomologist, 1940.

CABBAGE APHID CONTROL WITH NICOTINE VAPORIZER

Broccoli.--The King Farms of Bucks County each year produce from 4 to 450 acres of this vegetable for frozen food products. To obtain this outlet, broccoli must be free from insect injury - a problem in aphid and worm control. This particular farm uses two nicotine vaporizers, particularly for controlling aphids on this crop. In 1939 the work ran into much more money or cost than it should have, and yet the control of aphids was not any too good. We were called in by the farm manager to see if we could help locate the trouble. In looking over the vaporizing machine, it was noted that they were using the tractor exhaust heat for vaporizing the nicotine, and the temperature was so variable that much of the nicotine was not volatilized. This year, a small motor was attached to each machine for heating, only, and this provided a constant temperature high enough to volatilize all the nicotine. Fewer applications of the materials were made as a result of the change we suggested, and the aphid control on broccoli this year was exceptionally good.

--Annual Report, Pennsylvania Extension Entomologists, 1940.

SULFUR-DERRIS PREVENTED BEAN LEAFHOPPER DAMAGE

A. L. Sebesta, county agent of Dimmit County reports:

"Bean Leafhopper: J. J. Mowels of Carrizo Springs, Tex., harvested the only bean crop in the Winter Garden this fall, chiefly because he applied sulfur-rotenone dust at 10-day intervals. Mr. Mowel's one thought was to control powdery-mildew, and he applied the rotenone as an insurance against insect attack. This combination nonarsenical dust not only prevented the crops being wiped out by mildew, but repelled the bean leafhopper, an insect that completely destroyed adjoining fields of the same bean which he planted. The nonarsenical dust was used throughout the entire harvest period, and Mr. Mowels gives it credit for prolonging the harvest season. Over 600 bushels of beans were harvested on the 3 acres planted to the Giant Stringless Greenpod."

--Annual Report, Texas Extension Entomologist, 1940.

FOLIAR NEMATODE ON CHRYSANTHEMUMS

In the report for 1939 an outbreak of foliar nematode was discussed rather completely. This year three of the more extensive chrysanthemum growers in Delaware County agreed to produce the plants from terminal cuttings rather than to use old stock plants. In watering the new plants, they agreed to run the water over the soil surface instead of sprinkling the foliage. As a result, practically no trouble was experienced from foliar nematodes even on those varieties that were found to be very susceptible to nematode injury last year. The positive

results obtained should be of considerable value to chrysanthemum growers in Pennsylvania if continuing work in succeeding years gives equally comparable results.

--Annual Report, Pennsylvania Extension Entomologists, 1940.

TOMATO FRUITWORM

In every section where tomatoes are grown, the tomato fruitworm is responsible for considerable loss in marketable fruit. Because of the feeding habits of the insect, its control is difficult. None of the recommendations so far advocated seems to meet with popularity among the tomato growers of the State. This year a special effort was made to try in demonstrational work several of the recommended control measures for the tomato fruitworm. The calcium-arsenate-dusting program was tried in Scotland County with most of the tomato growers expressing dissatisfaction with the results. The cornmeal-arsenate of lead bait gave best results as reported by J. Claude Epting, agricultural agent for the Seaboard Air Line Railway Company. This bait, together with the practice of pulling and destroying the early infested fruit, offers some possibility of a solution to the tomato-fruitworm control problem.

--Annual Report, North Carolina Extension Entomologist, 1940.

CATTLE LOUSE CONTROL

Outstanding during the year has been the response to the use of cattle-louse powder. This powder costs about 50 cents a pound, and 1 pound will treat 10 head of cattle. The cost of preventing louse damage to animals is about 5 cents a head. Results of this campaign are shown:

	<u>Winter</u> <u>1937</u>	<u>Winter</u> <u>1938</u>	<u>Winter</u> <u>1939</u>	<u>Winter</u> <u>1940</u>
Animals treated.....	100	3,000	10,000	30,000
	(Possibly)			

Control of cattle warbles by this same louse powder formula is reported. Some additional research may show ways and means of making the treatment control warbles as well as lice. Some excerpts from county agents' reports follow relative to the control of cattle lice:

Anderson County: One hundred twenty pounds of material bought cooperatively for 73 farmers. Local druggists plan to mix.

Allendale County: Cattle feeders are watching their cattle more closely than ever before for cattle lice. Herd owners are making it a usual practice to treat their herds every fall. Examination of the cattle of J. M. Thomas and Newman Harter showed them heavily infested. After two treatments, no lice could be found.

Barnwell County: H. W. Sanders successfully treated 22 head of cattle for lice using the extension dusting formula, which treatment almost destroyed the lice. A second treatment about 2 weeks later gave complete control.

Calhoun County: Cattle lice are no longer a problem since the louse powder - - - has become so readily available and is so simple to use.

Chesterfield County: Fifteen farmers found their herds infested with lice. By following recommendations they had their herds entirely free in less than 3 weeks. Eight hundred and thirteen cattle were treated.

Colleton County: The 4-H Club boys are using this powder now on the calves they expect to show next spring.

Florence County: Every farmer who has used the powder reports that the kill was complete. Many farmers are now keeping this powder on hand at all times.

Marlboro County: Almost all cattle are infested with lice during the winter and early spring. Only a few demonstrations were necessary to get farmers to use this method, rather than to grease or dip in cold weather.

Orangeburg County: Farmers were well pleased with the results obtained. Forty-six farmers used 102 pounds of powder on 854 head of cattle.

Saluda County: The use of this louse powder has resulted in the cattle's going on winter feed in much better condition than in previous years.

The report cited similar testimonials from 27 counties.

---Annual Report, South Carolina Extension Entomologist, 1940.

HOUSEHOLD INSECTS

The household insects as a group present one of the greatest problems confronting the extension entomologist. More inquiries are received concerning these pests than are received concerning any other group of insects with which the extension entomology specialist deals. A constant flow of these requests is received and answered each week.

This year county agents and home agents have taken a greater interest in household-pest control.

---Annual Report, North Carolina Extension Entomologist, 1940.

4-H CLUB WORK

This work has been done sporadically for 4 years, and interest in it on the part of 4-H Club agents is increasing each year. During the year, the first 4-H Club in Entomology in the State was organized in Wyoming County. It has as its leader a teacher who specialized in the study of entomology.

A total of 6 days was given in Steuben, Wyoming, Broome, Monroe and Onondaga Counties, the last named being in connection with training 4-H Club boys and girls in insect identification as a part of their preparation to enter national vegetable identification contests. The other meetings included intensified education on insect habits, control, and recognition of the pests. At two of these meetings were representatives of groups from four or five adjacent counties. The total attendance at all meetings was 267 boys, girls, leaders and 4-H Club county agents.

---Annual Report, New York Extension
Entomologists, 1940.

WHAT IS THE JOB OF AN EXTENSION APIARIST?

It is essential to recognize that the honey production industry is one of the agricultural fields having the problem characteristic of any industry; namely, production, distribution, marketing, and consumer education. Educational methods should be used as a means of bringing reliable scientific information to growers so that production costs per unit can be reduced to the minimum and at the same time the highest quality maintained so that the delectable, healthful food "honey" can be available at a reasonable cost for human consumption.

Since the maximum pollinating activity from a colony of bees as well as a sufficient number of hive units are dependent largely upon efficient management, the hub around which the controlled pollination program must be built will necessarily be the honey production industry of the State.

The value of the honeybee population is many times more important to the welfare of agriculture than the value of the honey produced. This is evidenced by the fact that there are more than 5,721,117 acres devoted to crops that are dependent upon insect pollination and that field produce, having an annual value of approximately \$21,368,670. More indirectly, insect pollination makes it possible to utilize legumes for increasing the protein content in pasturelands and dry forage as well as restoring nitrogen to the soil, which together would have perhaps a conservative value of \$100,000,000. Thus, the honeybee is a link in the chain in establishing a stable agricultural program.

---Annual Report, Ohio Extension
Entomologist, 1940.

APICULTURISTS

The work in the bee culture project has been conducted by using the following methods:

- Beekeeping lectures.
- Beekeeping demonstrations and surveys.
- Pollination lectures and surveys.
- Conferences and farm visits.
- Correspondence.
- Correspondence course in bee culture.
- A new service to honey producers on color.
- Classification and moisture content of honey.
- Cooperation with the State Department of Agriculture.
- Cooperative work with county beekeepers' organizations.
- Cooperative work with the Ohio State Beekeepers' Association.
- Mimeographed material.
- Publications.

--Annual Report, Ohio Extension
Entomologist, 1940.

JUNIOR BEE MANAGEMENT CLUB

The junior 4-H bee club members had a fairly successful season in spite of adverse conditions. Club members averaged 56.4 pounds of honey per colony - 34.9 pounds greater than the State average of 21.5 pounds. The profits per colony per member were \$5.39. There are 25 4-H Bee clubs in the State with a membership of 203 boys and girls. The total production for all club members was 16,017 pounds of honey, worth \$2,402.15.

Club members had an increasingly important part in the general program of bee work in the counties. They set an example of what could be done in honey production per colony. They worked for disease control in their counties. The only county in the State where no active cases of American foulbrood were found by the State Inspection Service this summer was Forest County where the 4-H bee club work is very well established and where the members have been active in bringing this enemy, American foulbrood, under control.

--Annual Report, Pennsylvania Extension
Entomologists, 1940.

4-H BEE SUMMARY

Of 48 4-H bee club members 48 percent submitted completed records. The 23 members reporting had 80 hives valued at \$559.15, from which they netted \$298.10.

If it were not for the disagreeableness in handling bees, no doubt more club members would own them. Because of the value of honey as a food, it would probably be well to increase this enterprise.

---Annual Report, South Carolina Extension Entomologist, 1940.

MARKETING

Honey grading and marketing were emphasized during the entire year. Steps required for preparation of first-quality comb and extracted honey were discussed at the club round-ups, at the State farm show, and at meetings of county beekeepers' associations.

A sizable display of honey was set up in a large department store in Philadelphia last fall. A part of this display consisted of a duplicate set of 11 bottles showing the composition of honey. This set was copied from the set used for demonstration work in the State.

The value of attractive packages for marketing honey has been emphasized. Modernistic bottles for extracted honey and cellophane for comb honey have been recommended. The results of this work are indicated in the survey of Erie County in the following table. In this survey every store carrying comb honey had the sections either wrapped in cellophane or packed in cartons. The cellophane seems to be more desirable, since the customers can see the entire section, and honey cannot leak out when properly wrapped with cellophane. This difference will be emphasized in future meetings.

Honey marketing survey in Erie County, December 1939

	<u>Number</u>	<u>Percent</u>
Stores visited.....	50	
States represented, 9, and Cuba and New Zealand		
Stores carrying:		
Extracted honey produced in Pennsylvania.....	18	40
Extracted honey from other sources.....	37	82
No extracted honey.....	5	10
Comb honey produced in Pennsylvania.....	27	60
Comb honey from other States.....	9	20
No comb honey.....	14	28
Creamed honey.....	3	6
Stores with:		
Crystallized extracted honey in glass.....	10	22
Extracted honey that was dirty, foamy, or leaking.....	12	27
Comb honey in bad shape.....	11	31
Sizes extracted (5, 8, 10, 11, 12, 16, 24, 32 oz., 5-lb. pails and 5-lb. glass buckets).....	10	-

Honey marketing survey in Erie County, December 1939 - Continued

	<u>Number</u>	<u>Percent</u>
Prices:		
1-lb jars 17 to 42 cents; average 19 and 20 cents.		
5-lb. pails 39 cents to \$1; mostly 50 to 70 cents.		
8-oz. jars 10 to 25 cents; mostly 10 cents.		
5-oz. jars mostly 10 cents.		
Stores with comb honey:		
In cellophane.....	26	52
In cartons.....	13	26
Price of comb honey two for 25 to 30 cents each; mostly 15 to 20 cents each.		

In 1931 a similar survey was conducted in 100 stores. Figures on comb honey showed that 51 percent of the comb honey on display in these stores was not wrapped with cellophane or protected against dust or other damage.

The survey of 1940 revealed that 100 percent of comb honey was protected either with cartons or cellophane. This improvement in marketing practices represents an outstanding development during the past 10 years.

In 1931, 57 percent of comb honey was in bad condition, but in 1940 this factor was reduced to 31 percent.

In 1931, 45 percent of the stores did not handle extracted honey; in 1940 90 percent of them carried it.

--Annual Report, Pennsylvania Extension Entomologists, 1940.

TIMELY TOPICS

PARAFOULBROOD LIMITED TO SOUTHEAST

James I. Hambleton, principal apiculturist, Bureau of Entomology and Plant Quarantine, says that "considerable confusion seems to exist as to the prevalence of parafooulbrood in the United States. Some bee-keepers and even some inspectors refer to parafooulbrood with the utmost familiarity as though it were of common occurrence; but it is probably safe to assume that outside of certain limited areas in the southeastern part of the United States, few persons have seen parafooulbrood to recognize it. In some quarters the idea prevails that parafooulbrood is widely scattered in the Northern States, but so far as records in the Division of Bee Culture are concerned, only one sample of parafooulbrood has been received from a northern State.

"While it is true that the records in the bee culture laboratory cannot be used as an index of the prevalence of the disease, yet with the receipt of about 1,000 samples a year, it would be strange that more samples of parafoolbrood were not received from the North were this disease present to any extent."

SUGAR CONCENTRATION CONTROLS BEE ACTIVITY

G. H. Vansell, Davis, Calif., laboratory, Bureau of Entomology and Plant Quarantine, has been studying the effect on bee activity of sugar concentration in nectars. He draws the following general conclusions as the result of work thus far:

"Plants provide bees with nectars of different sugar concentration. Only part of this variation is because of difference in shape of blossoms, which is or is not conducive to evaporation. Some plant nectars are consistently rich in sugar, whether occurring in situations of low or high humidity. Notable cases are mustard and filaree, which appear always to yield relatively concentrated nectars. The approximate average values obtained in the field for a few plants are shown in a table below. The exact values change with additional data, but the relative position of a plant for a given locality remains fairly constant. The sugar concentrations in nectars studied are shown in the following tabulation.

<u>Source</u>	<u>Percentage of sugar</u>
Bartlett pear.....	10
Cleome.....	16
Orange.....	20 (1939) light crop
Orange.....	30 (1940) good crop
Blue curls.....	27
Star-thistle.....	38
Alfalfa.....	41
Mustard.....	50
Filaree.....	60

"A plant which is not abundant and does not carry a large number of blossoms can scarcely qualify as a major source of honey. In addition, it is concluded that, to be a major source of honey, the nectar in the plant must frequently show a concentration of at least 30 percent sugar. Bee activity is greatly influenced by sugar concentration; for example, in the orange orchards they prefer mustard, except when evaporation of water from the orange nectar increases its richness."

HOME-MADE BEESWAX CANDLES

A revival of the art of making beeswax candles at home in old-fashioned molds is in evidence, as these hand-molded candles are in demand among persons interested in antiques. Beeswax is also extensively used in high-grade commercial candles. Such candles have sufficient

rigidity to stand up well in the heat of summer, a quality not possessed by ordinary candles made of parawax. Beeswax candles are made commercially by dipping, rolling, or pouring. The beeswax must be very clean and quite clear, when in the liquid phase, to be satisfactory for candlemaking. G. H. Vansell, of the Pacific States Bee Culture Field Laboratory, Bureau of Entomology and Plant Quarantine, has studied candlemaking and has found that careful attention must be given to temperature control when molding beeswax candles. The temperature of the liquid wax should not exceed 155° F. when placed in the mold. Beeswax is adhesive and must be cooled very slowly to prevent it from sticking too tightly, or from cracking through shrinkage. When candles are only slightly stuck to the mold, they may be satisfactorily removed after thorough chilling by a dash of boiling water applied along the metal tube wall. Commercial wicks are recommended.

ENTOMOLOGISTS' SERVICE VALUED

The entomologist is an "unsung hero" of agriculture, Southern Agriculturist for June comments editorially, rendering prompt and effective service that runs into untold millions of dollars of profit to farmers each year. The "bug hunter," the editor adds, never seeks the public spotlight and seldom gets in it until an insect infestation threatens wholesale destruction to a section or State. Then his careful training and scientific knowledge is utilized to eradicate or control the pest.

EFFECT OF LOW MOISTURE CONTENT IN GRAIN ON CERTAIN INSECT SPECIES

According to R. T. Cotton, Manhattan, Kans., laboratory, Bureau of Entomology and Plant Quarantine, experiments to determine the effect of low moisture content in stored wheat and corn on various species of insects contained in it showed that, although some species succumbed rather promptly, others survived for long periods under such conditions. The rice weevil, the flat grain beetle, and the lesser grain borer failed to reproduce in grain having a moisture content of from 7 to 8 percent and died in a short time. On the other hand, the black carpet beetle and the confused flour beetle lived for long periods in such grain, but were unable to breed freely in it.

HESSIAN FLY-RESISTANT WHEAT MAKES GOOD SHOWING IN FIELD TEST

W. B. Noble, Sacramento, Calif., laboratory, Bureau of Entomology and Plant Quarantine, reports that in 1940 about 30 acres of Big Club 38 (Dawson X Big Club) fly-resistant wheat was grown for field test in Solano County, Calif. This wheat showed a 96-percent reduction of plant infestation and a 30-percent increase of yield, as compared with adjacent regular Big Club variety.

REMOVAL OF LEAD AND ARSENIC SPRAY RESIDUES ON APPLES

At the meeting of the Western Cooperative Spray Project in Seattle, Wash., on February 13 and 14, C. C. Cassil, of the Division of Insecticide Investigations, Bureau of Entomology and Plant Quarantine, and Edwin Smith and A. L. Ryall, of the Bureau of Plant Industry, presented the results of cooperative experiments on the removal of lead and arsenic spray residues from apples. The data presented in this report indicate that only fruit sprayed with relatively light spray schedules can be cleaned by washing once in cold acid. The use of somewhat heavier spray schedules requires the application of some heat in single or dual washes for satisfactory cleaning. Fruit with heavy spray schedules can be cleaned to meet the new tolerances only by the application of relatively severe dual-process washes at temperatures which approach or are beyond the danger point of fruit injury.

CONTROL OF (CANTALOUPE) PICKLEWORM

In a 3-year study, F. S. Arant, of the Alabama Experiment Station, obtained 85 to 90 percent control of the pickleworm, worst enemy of the cucumber, cantaloupe, and squash, by completely covering the vines with 1 percent rotenone dust, says the Progressive Farmer (June). The dust may be prepared at home or by mixing one part of 4 percent rotenone powder and three parts talc. A dust gun is more effective than a sack. In 1940, on five dusted plots, 3,200 worm-free cantaloupes were gathered to an acre. The undusted acre yielded only 92 good melons. The cost of dusting an acre nine times is about \$12.

DILUENTS FOR NATURAL CRYOLITE IN CONTROLLING TOMATO FRUITWORM

J. Wilcox and R. E. Campbell, of the Alhambra, Calif., laboratory, Bureau of Entomology and Plant Quarantine, report that a smaller percentage of tomato fruits were damaged by Heliothis armigera (Hbn.) on plants treated with a dust mixture of natural cryolite containing 70 percent Na_3AlF_6 diluted with talc and with soapstone than on plants treated with natural cryolite of the same strength diluted with sterilized tobacco dust or with walnut-shell flour.

BEET MOLASSES AS A DISPERSING AGENT FOR PHENOTHIAZINE

E. F. Knipling, of the Portland, Oreg., laboratory, Bureau of Entomology and Plant Quarantine, reports that beet molasses may be useful as a wetting agent for dispersing phenothiazine in water. When used in the same manner as is Turkey Red oil or other wetting agents, at the rate of five parts molasses to one part phenothiazine, a fair suspension of the phenothiazine was obtained.

NECESSITY OF A LOW OXYGEN CONCENTRATION FOR HATCHING
AEDES MOSQUITO EGGS

No doubt most workers believe that mosquito eggs will hatch when brought in contact with water, whatever the source. C. M. Gjullin, of the Portland, Oreg., laboratory of the Bureau of Entomology and Plant Quarantine, however, reports that Aedes mosquito eggs do not hatch well when flooded with rain-water, tap water, or other water containing a normal amount of dissolved oxygen. After extensive tests, Mr. Gjullin, C. P. Hegarty, and W. B. Bollen of the Oregon State College Cooperative, discovered that a reduction of oxygen in the water is of itself capable of causing a rapid and high percentage of hatch. This discovery makes it possible to obtain with ease Aedes mosquito larvae for testing insecticides, and also suggests some possible new lines of attack against these troublesome pests.

DIHYDROROTENONE

Among the numerous derivatives of rotenone thus far studied, only dihydrorotenone retains the high insecticidal action of the parent compound. The apparently greater stability of this derivative has led to its commercial production. Catalytic hydrogenation of rotenone produces, in addition to dihydrorotenone, the nontoxic hydrogenation products--rotenonic acid, dihydrorotenonic acid, and dihydrorotenol. To develop a method for the determination of dihydrorotenone in the mixture of hydrogenation products, some of the physical and chemical properties of these compounds were examined.

A combination of physical properties will give some information as to the amount of dihydrorotenone present, but a better method is based on the observation that this is the only reduction product giving an appreciable red color by the Goodhue test. L. D. Goodhue and H. L. Haller, of the Division of Insecticide Investigations, Bureau of Entomology and Plant Quarantine, have proposed a method based on this test which is described in Industrial and Engineering Chemistry (Analyt. Ed., v. 12, no. 11, pp. 652-654, November 1940).

645,000 FAMILIES GROW GARDENS UNDER AAA PLAN

The United States Department of Agriculture reported June 30, 1941, that 645,254 farm families in 11 States provided themselves with better diets by growing home gardens under a special home gardens provision of the 1940 Agricultural Adjustment Administration farm program. This practice was offered for the first time last year and is being included again in 1941 on an expanded basis. Under the practice, \$1.50 is offered cooperators to assist them in planting a home garden. A report just compiled on the garden practice in 1940 shows that North Carolina headed the list with 156,539 home gardens eligible for the \$1.50 payment, and Texas was second with 148,861. Specific requirements for earning the garden payment vary among the States. In general, however, they provide that the garden must contain a wide variety of vegetables to provide a well-balanced diet for the family.

FLORIDA TRIES SPECIALTY CROPS

Pinch hitting for France, Italy, the Balkans, Japan, and other countries, Florida is trying its hand at growing some of the foreign specialty imports cut off by war, says Science News Letter, June 21. Crops which the Florida Experiment Station advises as worthy of trial plantings are French endive, formerly imported from France and Belgium; small tomatoes for tomato paste, from Italy; sage for seasoning, from Greece; paprika, from the Balkans; spinach seed, from Holland and Denmark; mustard and turnip seed, from Japan; and teasel burs, from France. Teasel burs, considered good for combing wool in American mills, are to be planted on the Experiment Station farm for trials.

CORK, RUBBER PLANTINGS IN CALIFORNIA

Cork trees from Spain and rubber bushes from Mexico are being cultivated in California Experiment Station nurseries, in efforts to replace supplies from abroad, says Science News Letter, June 21. In the autumn, 10,000 cork-oak seedlings will be distributed free to persons showing that they can plant and care for 50 or more trees. Experimental plantings in the State indicate that the soil and climate in California are as suitable as those of Spain for cork production. The rubber bushes are the species known as guayule, native to northern Mexico, of which successful plantations are now in southern California. The guayule bushes are being grown in a rubber company nursery.

U. S. D. A. PLANT SPECIALISTS LEAVE ON MEXICAN SURVEY

H. T. Edwards and J. H. Kempton, tropical plant specialists of the United States Department of Agriculture left Washington recently for an agricultural survey of Mexico and other Central American countries. The survey, under the direction of the Latin American division of the Department, is being made to investigate possibilities of developing in the American tropics products now imported by the United States from more distant tropical regions. Among the important plants that might be developed as crops in Central America -- and which cannot be grown in this country -- are: Abaca, imported from the Philippines for manufacturing rope; cinchona, imported from the East Indies for manufacture of quinine; chia, imported from China for manufacture of oil used in the paint and varnish industry; derris, imported from the East Indies for use in insecticides; kapok, imported from the East Indies and used in upholstering and in life preservers; and licorice, imported from Asia Minor and used in the manufacture of chewing tobacco. The survey is being made at the invitation of the Mexican Government and will last approximately 3 months.

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THE HISTORY OF THE UNITED STATES

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